

This is the supplement for the original manual (No. IM 01G05B03-01E, 1st Edition) regarding the added and changed items. Please also refer to this supplement when you read the manual.

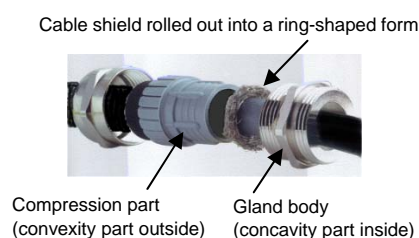
Addition to the section "3.5.4 Connection of the Transducers" (page 18) :

(1) Cable Finish

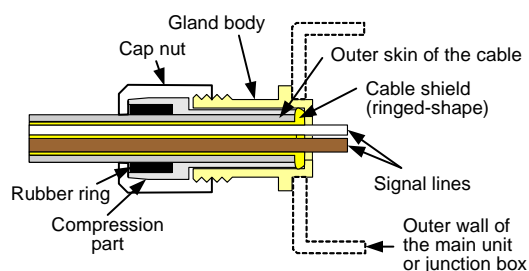
The cable finish should be done as the drawings (a) and (b) shown in the right.

(2) Cable Gland

When tightening the gland, not only pull back the cable shield (meshed part) but also roll it out into a ring-shaped form and let it be pushed by the compression part (grey-colored plastic) so that the cable shield will have electrical contact with the gland body. Also, be sure to align the convexity part outside the compression part and the concavity part inside the gland body. Refer to the drawings below.



Components of the cable gland

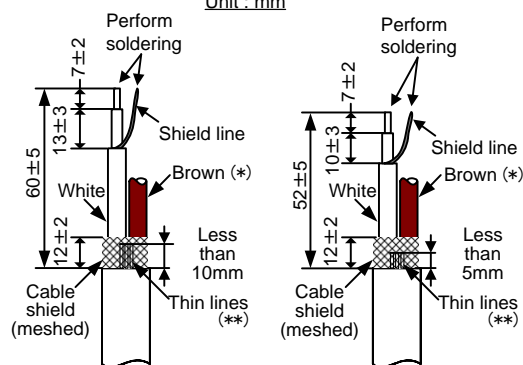


Cutaway view of the cable gland

(a) Main unit side

(b) Junction box side

Unit : mm

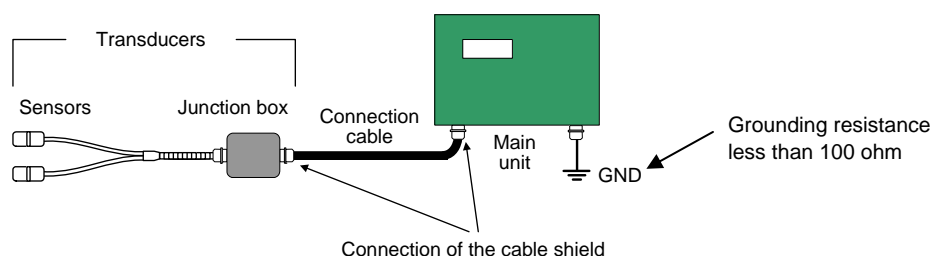


(*) Finish the brown cables as well as white cables.

(**) You do not connect the thin lines to any terminals.

(3) Grounding

The connection of the cable shield will be realized as shown in the drawing below after going through the procedures (1) and (2) in the above. Connect the main unit to the ground through the terminal "PE" of the power supply terminals in the main unit. The grounding resistance should be less than 100 ohm.





(4) Connecting the Sensor ROMs

Connect the sensor ROMs to the corresponding terminals in the main unit when connecting transducers. The sensor ROMs are packed and affixed to the transducers when shipped from the factory.

Changes to the section “3.1 Scope of Delivery” (page 11) :

Change the figure of a nameplate to as below.

ULTRASONIC FLOWMETER	
MODEL	US300FM
SUFFIX	
STYLE	
SUPPLY	
F-NO.	
NO.	
TAG-NO.	
	
YOKOGAWA  Made in Germany	

Addition to the section “3.1 Scope of Delivery” (page 11) :

When ordering a couplant weatherproof type (by couplant code “R” in the transducer specification or model code USPA097), a package of “Shin-Etsu Silicone, 1 COMPONENT RTV (KE45T)” is delivered.

Addition to the section “3.3 General Precautions” (page 12) :

- Do not disassemble or remodel.

Addition to the section “3.5.1 Location” (page 13) :

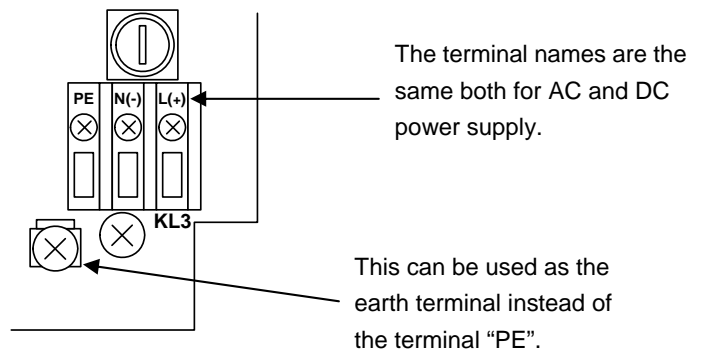
Attention! The instrument must not be installed in a corrosive atmosphere.

Attention! Use Submersible(IP68) type transducers when they are installed where condensation occurs. A Tokuchu request is necessary for Submersible type. However the diameter must be over 100 mm.

Changes to the section “3.5.5 Connection to the Power Supply” (page 20) :

(1) Terminal Block (page 19)

The outer shapes of the terminal block for power supply connection, the printed terminal names, and the design on the board below the terminal block have been changed as the drawing in the right.



(2) Terminal Assignment (page 21)

Regarding the terminal assignment, the terminal names were revised as below from the original manual. The needed power supply is given in the nameplate on the housing, not in the plate below the terminal block.

AC power supply		DC power supply	
Terminal	Connection	Terminal	Connection
PE	Earth	PE	(Earth)
N(-)	Neutral	N(-)	- DC
L(+)	Phase 100...230 V AC $\pm 10\%$	L(+)	+ DC 24V DC $\pm 10\%$


Addition to the section “3.5.5 Connection to the Power Supply” (page 20) :

Install an external switch or circuit breaker as a means to turn the power off (capacitance; 15A, conforming to IEC947-1 and IEC947-3). Locate this switch either near the instrument or in other places facilitating easy operation. Affix a “Power Off Equipment” label to this external switch or circuit breaker.

Changes to the section “3.6 Sensor ROM” (page 22) :

The sensor ROMs are packed and affixed to the transducers when shipped from the factory, not inserted to the terminals in the main unit. They shall be connected to the corresponding terminals in the main unit when installation.

Addition to the section “3.7 Replacement of the Fuse” (page 22) :



Be sure to use the fuse which satisfies the specification below.
Components may otherwise be damaged.

Changes to the section “3.7 Replacement of the Fuse” (page 22) :

Change the fuse specification “250V 1.25A, delayed action Type T” to as below.

“250V 1A delay type” for AC power supply

“250V 1.6A delay type” for DC power supply

Addition to the chapter “4. Getting Started” (page 23) :

Attention!

The current outputs may temporarily turn unstable during the power-on sequence (including re-starting after power failure) and parameter display / setting mode. Take care of your process not to be affected by this behavior.



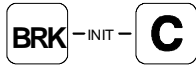
Addition and deletion to the section “4.1.1 Key Operations” (page 23) and related pages :

Refer to the following table for the function of corresponding key operations.

The correct explanations for these key operations in the related pages are also as the table below.

Related pages: “4.1.1 Interruption of Power Supply” (page 27)

“15.2 US300FM doesn’t react anymore” (page 106)

	Switches the background lighting ON/OFF.
	<p>[Operation during the measurement or menu display]</p> <p>RESET: Press these three keys simultaneously to recover from an error. This has the same effect as restarting the unit. Data will not be affected.</p> <p>INIT (cold start): Press these three keys simultaneously and release ENTER first. After acknowledging the display of main menu, release (i) BRK key first and then (ii) C key. This will initialize the instrument. Most parameters and settings are reset to the factory default values. The memory will not be cleared.</p> <p>Note that when the data logging function is activated, the DELETE MEAS. VAL. display will appear instead of main menu. In this case, after releasing (i) BRK key first and then (ii) C key, select NO or YES and then press ENTER to finish the procedure.</p>
	<p>[Operation when powering the instrument on]</p> <p>INIT (coldstart): Pressing these two keys simultaneously and after acknowledging the display of main menu, release (i) BRK first and then (ii) C. This will initialize the instrument. Most parameters and settings are reset to the factory default values. The same procedure is required as above when the DELETE MEAS. VAL. display appears.</p>

Addition to the section “4.4.1 Interruption of Power Supply” (page 27) :

Attention!

The current outputs may temporarily turn unstable during the power-on sequence after power failure. Take care of your process not to be affected by this behavior.

Addition to the chapter “5. Basic Measurement” (page 29) :

Note!

When changing any settings in "PARAMETER" program branch, be sure to also go through "MEASURING" program branch to the end where the measurement will start. In this case, you do not always have to fix the transducers on to the pipe, and thus you do not always need to get the actual flow measurement.

If you shut off the power supply without taking this procedure, the settings to be changed would not be effective and keep the same settings as before.

Addition to the section “5.4 Selection of the Sound Path Factor” (page 34) :

When the pipe outer diameter is more than 600mm, the sound path factor as “1” (one) is recommended. Otherwise, the measurement may become unstable when flow velocity or fluid temperature changed.

Addition to the section “5.5.2 Mounting of the Transducers” (page 35) :

The pipe wall thickness may slightly vary from part to part. Check it in advance by applying a wall thickness probe or some other ways and avoid mounting the transducers on such parts.

Attention!

Instructions for using “Acoustic couplant weatherproof type” (Shin-Etsu Silicone, 1 COMPONENT RTV) are as below.

- The operating condition of ambient temperature
Before and during curing : 0 to +50°C / 32 to 122°F
After curing : -40 to +180°C / -40 to 356°F
- When applying this couplant, cut the tip of attached nozzle to appropriate length and set it to the tube container. Also, remove matters like dust or oil on the surface to be applied. Otherwise, its adhesion force may become lower.
- When curing this couplant, keep the ambient and installation position temperature between 0 to +50°C (32 to 122°F). If not, the flow measurement may fail because of air bubbles formed inside the rubber before curing, etc.
- It usually takes one to three days for complete curing depending on the conditions.

Addition to the section “5.5.2.2 Mounting with Fixtures and Chains” (page 36) :

Attention!

When using mounting fixtures, there may arise some air gap between the transducer surface and pipe wall because of any distortion of the pipe wall. Make sure to avoid having such air gap between them.



Addition to the section “6.1 Selection of the Physical Quantity and of the Unit of Measurement” (page 39) :

Attention!

In case of mass flow, select “Other Medium” as a measured fluid. When “Other Medium” has been selected, US300FM requests to enter the density which is used to calculate mass flow.

Changes to the section “7.2 Flow Totalizers” (page 43) :

Two of the key operations have been changed as below, requiring pressing the keys “three times” .

To reset the two flow totalizers to zero:	Press key  three times when a totalizer is displayed.
To deactivate flow totalizing:	Press key  three times when a totalizer is displayed.

Addition to the section “14.5 Activation of a Pulse Output” (page 95) :

Maximum pulse output rate is 2 pulse per second (+/-20%).

Set the “Pulse Value” and the “Pulse Width” so that the actual maximum flow in the pipe is less than half the displayed value (“Max – Value”).

Example:

The actual maximum flow 120m³/h


Pulse Value = 0.02m³

Pulse Width = 150ms

INFO: Max – Value

240.0m³/h

Attention!

It is necessary to activate flow totalizers by pressing key  to get the actual pulse output. Refer to the section 7.2 (page 43) for flow totalizers.

Changes to the chapter “A Standard Specification” (page 109 to 116) :

Please use the following sheets for this chapter.

A Standard Specifications

US300FM

● General

Fluid:

Liquid (Turbidity < 10,000 mg/L, Sound velocity 800 to 3,500 m/s, Temperature –30 to +200°C / –22 to +392°F)

Measured Quantities:

Volume flow, mass flow (by setting density), flow velocity, sound velocity in the fluid

Measuring Principal:

Transit time method using ultrasonic signal

Pipe Sizes:

25 to 6,500 mm (1 to 255 inches) (covered by three types of transducers)

Pipe and Lining Materials:

Carbon steel, Stainless steel, Grey cast iron, Ductile iron, Copper, Glass, PVC, etc.

Flow Velocity Range:

±0.01 to ±25 m/s (±0.033 to ±82 ft/s)

Resolution:

0.025 cm/s (0.01 in/s)

Repeatability:

0.15% of reading ±0.01 m/s (0.033 ft/s)

Accuracy:

(Note) Under fully developed rotationally symmetrical flow profile

Volumetric flow:

±1 to 3% of reading ±0.01 m/s (0.033 ft/s) depending on pipe geometry and accuracy of entered pipe dimensions.

Flow velocity:

±0.5% of reading ±0.01 m/s (0.033 ft/s) over sonic path

Measuring Cycle:

100 to 1000 Hz (per one channel)

Straight Pipe Run in the Upstream:

10 to 50 pipe diameters, depending on the kind of flow disturbances

● Ultrasonic Flowmeter, Main Unit

Housing Material:

Aluminum

Painting:

Front cover:

Deep sea moss green, Polyurethane and acrylic resin corrosion-resistance waterbased coating

Back cover:

Agate grey, Polyester resin corrosion-resistance powder coating

Degrees of Protection:

- IP65 (EN60529)

Mounting Method:

- Wall mounting
- Pipe mounting fixture (for 2-inch pipe, optional)

Measuring Input :

One or two (dual) (Channel A, Channel B).

Current Output:

- One or two
- Range 4 to 20 mA (Load resistance 0 to 500 Ω)
Note: The current outputs may temporarily turn unstable during the power-on sequence (including restarting after power failure) and parameter display / setting mode. Take care of your process not to be affected by this behavior.

Frequency Output:

- None (standard), or one (optional)
- Range 0 to 1 kHz
- Contact type: Open-collector, 24 V / 4 mA

Binary Output:

- None (standard), one, or two (optional)
- Contact type: Open-collector, 24 V / 4 mA

Input / Output Terminal Configuration:

Screw-type pillar terminals

LCD Display:

2 line x 16 character LCD display with backlight. Configurable to display two measured values (e.g., flow rate and total flow) simultaneously, or to display values from optional dual input channels alternately.

Keyboard:

15 keys (numerical, functional, or both) including four arrow-shaped keys for cursor operation, enabling easy access through its interactive menu structure.

Display Language:

Czech, Danish, Dutch, English (default), French, German, Norwegian, Polish, Turkey

Flow Measurement:

Flow velocity, Volume flow, Mass flow

Sound Velocity / Signal Amplitude Measurement (On-line):

Sound velocity and signal amplitude in the fluid available on-line simultaneously with flow measurement.

Totalization Function:

Totalizes the volume flow or mass flow. Ten-digit number for both forward/reverse directions of each channel.

Damping Function:

Time constant 0 to 100 seconds, moving average.

Sound Velocity Measurement (Off-line):

Measures the sound velocity of unknown fluid starting from its estimated sound velocity. The result can be transferred to the current fluid parameter.

Arithmetic Operation on Optional Dual-Channel / Dual-Path Inputs:

Arithmetic operations get the outcomes for calculation channel Y and Z by taking sum, average, or difference of two flow values from input channel A and B. Taking absolute values of each input independently in the calculation is also possible.

Note: Two sets of transducers are necessary.

Pulse Output (optional):

Available via optional binary outputs.

- Pulse value: 0.01 to 1000 of totalization unit
- Pulse width: 100 to 1000 ms ($\pm 20\%$)
- Maximum output rate: 2pps (pulse/second) $\pm 20\%$

Alarm Output (optional):

Available via optional binary outputs where each alarm item is assigned one-to-one. Alarm properties are also selectable for each alarm one-by-one.

- Alarm items: High limit, Low limit, Flow direction change, Quantity limit (for batch operation), and Error (measurement impossible)
- Alarm properties: Normal open / Normal close, Non-hold / Hold (at the alarm detection)

Output Signal Configuration:

Freely configurable including independent dual flow value outputs.

- Current / frequency outputs: Flow velocity, Volume flow, Mass flow, Sound velocity, or Signal amplitude
- Binary outputs: Pulse or Alarm

Data Logging Function:

Data storage capacity of 27,000 values.

Storage rate is selectable from 1 s, 10 s, 1 min, 10 min, 30 min, 1h, or any other rate between 1 s to 43200 s (12 h) by the second. For each period of measurement, stored values are grouped by a user-defined measuring point name.

Stored values can be transferred to a personal computer via RS232 serial communication port.

(Note) As the RS232 port is on the front panel inside housing, use this function only for test / service / maintenance purposes.

Communication Function:

Transfers the measured values to a personal computer or a serial printer. Both on-line/off-line transfer during/after the measurement available.

- Output item: Flow value (flow velocity, volume flow, or mass flow), Totalization (forward, reverse), Sound velocity, Signal amplitude
- Output format setting: Spacing (for printer), Decimal point character, Data delimiter
- Communication interface: RS232
- Communication port: D-sub 9-pin, male

(Note) As the RS232 port is on the front panel inside housing, use this function only for test / service / maintenance purposes.

Time-Programmable Measurement Function:

Automatic start / stop of the measurement without human operation using internal clock for specific systems. Can be used with current output, binary output, data logging function, and/or communication function for recording the measurement.

Site Parameters Storage Function:

Eliminates the necessity of re-entering parameters for additional measurement on a site.

Totally 80 sets of site parameters for pipe/fluid settings are available with user-defined site names.

Material / Fluid List Customization Function:

The lists of material / fluid in the parameter menu are editable. Unnecessary items can be cut off from the menu for user's convenience. Registration of new material / fluid data is also possible totally up to 13 items with user-defined names.

Power Supply:

Power supply voltage:

100 to 230 VAC $\pm 10\%$ (50/60 Hz $\pm 5\%$) or 24 VDC $\pm 10\%$

Power consumption: Less than 15 W

Safety and EMC Standard:

General safety: EN61010-1:2010

EN61010-2-030:2010

- Altitude at installation site:
Max. 2000 m above sea level
 - Overvoltage category:
Overvoltage category II
 - Pollution degree:
Pollution degree 2
- EMC regulation: EN61326-1:2006

Operating Conditions:

Ambient temperature: -10 to $+60^{\circ}\text{C}$ (14 to 140°F)

Ambient humidity: 0 to 95% RH or less (Non-condensation)

Note: Lengthy operation at 80% or more is not recommended.

● Transducers

Basic Construction:

A set of transducers are composed of a pair of sensor elements (often called just as "transducers"), and transducer cables with a junction box at one end, which is to be connected to US300FM main unit by dedicated connection cable US300FC.

The transducer cables are armed with stainless steel flexible tube.

(Note) Fixing hardware (fixing strap, clips, etc.) and acoustic couplant are usually included in a set of transducers, specified in its model code by their kinds or with/without.

Material:

Case of sensor elements:

Stainless steel EN/DIN 1.4571 (JIS SUS 316Ti, AISI 316Ti SS equivalent)

Sensing surface of sensor elements:

General temperature type: PEEK (Poly Ether Ether Keton)
High temperature type: Polyimide

Degrees of Protection:

General type: IP65 (EN60529)

Immersible type: IP67 (EN60529)

Applicable Pipe Sizes (inner diameter):

Medium type: 25 to 400 mm (1 to 16 inches)

Larger type: 100 to 2,500 mm (4 to 98 inches)

Very large type: 2,000 to 6,500 mm (78 to 255 inches)

(Note) Only "6,500 mm" above is the size for outer diameter.

Fluid Temperature Range:

General temperature type:

–30 to +130°C (–22 to +266°F)

High temperature type:

–30 to +200°C (–22 to +392°F)

Note: Pay attention also to temperature specification of the couplant you choose.

● **Connection Cable**

Connection cable is always necessary to connect the transducers (junction box) and the US300FM main unit. The length is specifiable from 1 m (3 ft) to 300 m (984 ft) by the meter.

● **Accessories**

Fixing Hardware, Couplant, etc:

Specified in the suffix code of US300FM/US300FT. Model codes as accessories also available for separate/additional orders (listed later).

● **Data Transfer Software**

General:

The software installed on a personal computer receives one or more records of logging data and parameter sets stored in US300FM main unit via RS232 communication port.

Data can be viewed or graphed on a PC monitor, or exported as a text file.

This software works while US300FM is off-line (not measuring flow) where current output goes down to zero.

Function:

Displaying Parameter Record:

Display parameter record of selected measuring data set.

Displaying Measured Data in Table:

Display measured data of selected measuring data set in table format.

Displaying Data in Graph:

Display measured data of selected measuring data set in graphic format. Marker type and color for each line of values selectable. Scales for time-axis and value-axis can be changed from default condition of automatic scaling. Graph printing function embedded.

Displaying Statistical Data:

Display statistical data of the measurement. Total data points, minimum, maximum, average and standard deviation of the measured data can be shown. Data range for statistical processing can be designated if necessary.

Exporting Text File:

Parameter record and measured data can be exported to a text file. Options for exporting items or their formats are available.

Entering Remarks:

User's remarks for each measured data can be entered and edited in the transferred data file on a personal computer. Remarks can be displayed in the main window of the software.

Display Language:

English, German

(Note) Help is available only in English.

Operating Environment:

Personal Computer:

Microsoft® Windows® hardware compatible, one or more RS232 port

Operating System:

Microsoft® Windows® 98, ME, NT, 2000, XP

Standard Accessories:

RS232 cable, RS232 adapter 9/25

* Microsoft® and Windows® are registered trademarks of Microsoft Corporation in the United States and/or other countries.

■ **Units of Measurement**

Volume flow	Flow velocity	Mass flow	Totalizers		Sound velocity
			Volume	Mass	
m3/h	m/s	g/s	m3	g	m/s
m3/min	inch/s	t/h	l	kg	
m3/s		kg/h	gal	t	
l/h		kg/min			
l/min					
l/s					
USgph					
USgpm					
USgps					
bbl/d					
bbl/h					
bbl/m					

1 gallon [US] = 3.78 l; 1 barrel = 42 gallons = 158.76 l

■ Model and Suffix Code

Ultrasonic flowmeter

Model	Suffix code	Specification
US300FM	Ultrasonic flowmeter
Output	-A1	One current output
	-A2	Two current outputs
Power Supply	1	100 to 230 V AC $\pm 10\%$
	4	24 V DC $\pm 10\%$
Input Channel	-1	One input channel (one-path)
	-2	Two input channels (dual-path)
Electrical connection	-4	ISO M20 x 1.5, female
Option	/PU1	One binary (pulse or alarm) output (open-collector) (*1)
	/PU2	Two binary (pulse or alarm) outputs (open-collector) (*1)
	/FQ1	Frequency output (open-collector, 0 to 1 kHz) (*2)
	/BGT	Tag number on nameplate (in the nameplate label, maximum 16 characters)
	/SCT	Tag number on stainless steel tag plate (maximum 16 characters)
	/PMT	Pipe mounting fixture

*1: Option /PU1 and /PU2 are exclusive.

*2: Option /FQ1 is not selectable for two current output (-A2) models

Connection cable (*8)

Model	Suffix code	Specification
US300FC	Connection cable
Length	-Gxxx	xxx: Cable length 001 to 300 [m]

*8: Two sets of connection cables are necessary when applying dual channel/path measurement.

Data transfer software

Model	Suffix code	Specification
US300SA	Data transfer software (Windows version) Including connecting kit (RS232 cable for connection, RS232 adapter 9/25)
Language	-1	English / German version
	00	Always 00

Transducers (*3)

Model	Suffix code	Specification
US300FT	Transducers for fixed type
Usage (*4)	-G	General purpose (IP65)
	-W	Waterproof (IP67)
Pipe Size / Fluid Temperature (*5)	BG	Medium & General (with 3 m / 9.8 ft cable)
	BH	Medium & High (with 3 m / 9.8 ft cable)
	CG	Large & General (with 4.4 m / 14.4 ft cable)
	CH	Large & High (with 4.4 m / 14.4 ft cable)
	DG	Very large & General (with 12 m / 39.4 ft cable)
	-N	Always N
Fixing band, strap and clips (*6)	B	For 25 to 1,400 mm (1 to 55 in.) Two fixing bands One strap of 10 m (32 ft) length Two clips of medium type Two clips of large type
	C	For 1,400 to 2,800 mm (55 to 110 in.) One strap of 20 m (65 ft) length Two clips of large type
	D	For 2,800 to 6,500 mm (110 to 255 in.) Two straps of 20 m (65 ft) length Two clips of large type
	N	None
Acoustic couplant (*7)	G	General temperature type (non-adhesive, -30 to +130°C / -22 to +266°F)
	H	High temperature type (non-adhesive, -30 to +200°C / -22 to +392°F)
	R	Weatherproof type (adhesive, -40 to +180°C / -40 to +356°F)
	N	None
Option	/TTP	Transducer tag plate (maximum 16 characters)

*3: Two sets of transducers are necessary when applying dual channel/path measurement.

*4: A Tokuchu request is necessary when transducers are installed where condensation occurs. However the pipe size must be over 100 mm (Large type or Very large type).

*5: The alphabetic characters in the suffix code represent pipe sizes and fluid temperature ranges are below.

B: Medium type (25 to 400 mm / 1 to 16 in.)

C: Large type (100 to 2,500 mm / 4 to 98 in.)

D: Very large type (2,000 to 6,500 mm / 78 to 255 in.)

G: General temperature (-30 to +130°C / -22 to +266°F)

H: High temperature (-30 to +200°C / -22 to +392°F)

*6: When the pipe size is less than 50 mm (2 in.), select N(None) here first and order separately one each of USPA053 mounting fixture short ruler type, USPA036 fixing chains (0.5 m/1.6 ft length), and USPA097 couplant weatherproof type. It will avoid any stress that could be caused by expansion of the pipe after installation. The couplant weatherproof type can be specified by the code R for couplant.

Standard Specifications

*7: The couplant weatherproof type is recommended for permanent installation in the outdoor, etc. It is adhesive liquefied rubber and tight contacts between transducers and pipe surface can be obtained by curing it. It usually takes one to three days for complete curing depending on the conditions. The operating condition of ambient temperature is as below.
Before and during curing : 0 to +50°C / 32 to 122°F
After curing : -40 to +180°C / -40 to 356°F

Accessories (for ultrasonic flowmeter US300FM)

Model	Description
USPA201	Pipe mounting fixture(to add the option /PMT)
USPA221	Blind plug for cable gland port
USPA231	Cable gland

Accessories (others)

Model	Description
USPA401	RS232 cable (*9)
USPA402	RS232 adapter 9/25 (*9)
USPA411	Measuring tape

*9: Included in data transfer software US300SA as standard.

Accessories (for transducers US300FT)

Model	Description
USPA001	Fixing strap (10 m / 32 ft length)
USPA002	Fixing strap (20 m / 65 ft length)
USPA011	Fixing clips (medium type, for pipe size 40 to 100 mm / 1.5 to 4 in., set of two clips)
USPA012	Fixing clips (large type, for pipe size 100 to 6500 mm / 4 to 255 in., set of two clips)
USPA021	Fixing bands (only for pipe size 25 to 50 mm / 1 to 2 in.)
USPA032	Fixing chains (set of two extensible chains) (2 m / 6.5 ft length, equal to 600 mm / 23 in. diameter)
USPA033	Repair set for fixing chains
USPA034	Retaining clips (set of two clips, used with fixing chains)
USPA036	Fixing chains (set of two extensible chains) (0.5 m / 1.6 ft length, equal to 150 mm / 5.9 in. diameter)
USPA037	Fixing chains (set of two extensible chains) (1 m / 3.2 ft length, equal to 300 mm / 11.8 in. diameter)
USPA053	Mounting fixture short ruler type (for transducers medium pipe size type, temperature range -30 to +200°C / -22 to +392°F, set of two blocks with 120 mm / 4.7 in. ruler)
USPA054	Mounting fixture standard type (for transducers medium pipe size type, temperature range -30 to +200°C / -22 to +392°F, set of two blocks with 330 mm / 13 in. ruler)
USPA055	Mounting fixture magnetic general temperature type (for transducers medium pipe size type, temperature range -30 to +100°C / -22 to +212°F, set of two blocks with 330 mm / 13 in. ruler)
USPA057	Mounting fixture standard type (for transducers large or very large pipe size type, temperature range -30 to +200°C / -22 to +392°F, set of two blocks with 330 mm / 13 in. ruler)

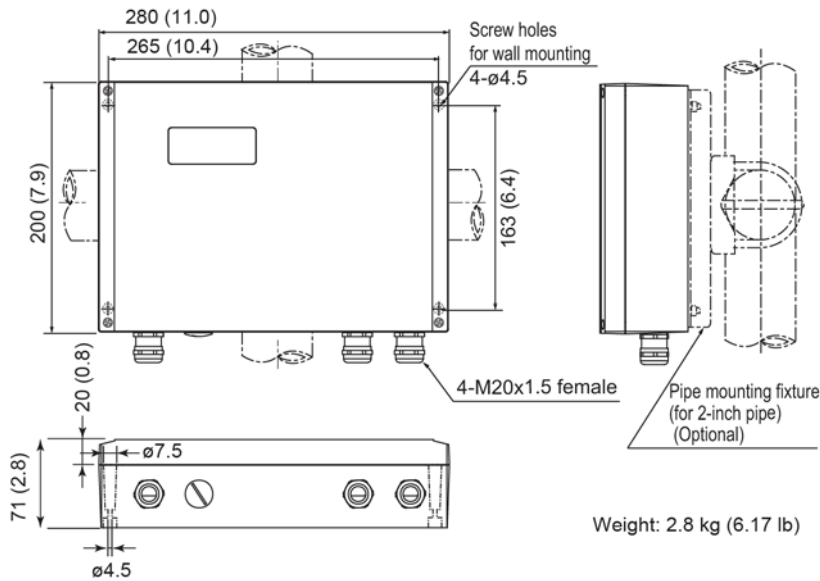
USPA058	Mounting fixture magnetic general temperature type (for transducers large or very large pipe size type, temperature range -30 to +100°C / -22 to +212°F, set of two blocks with 330 mm / 13 in. ruler)
USPA073	Additional magnets for mounting fixture magnetic general temperature type (for transducers medium pipe size type, temperature range -30 to +100°C / -22 to +212°F, set of two magnets)
USPA075	Additional magnets for mounting fixture magnetic general temperature type (for transducers large or very large pipe size type, temperature range -30 to +100°C / -22 to +212°F, set of two magnets)
USPA081	Ruler for mounting fixture (marked length 120 mm, equivalent to 4.7 in.)
USPA082	Ruler for mounting fixture (marked length 330 mm, equivalent to 13 in.)
USPA091	Acoustic couplant general temperature type (non-adhesive) (100 g, -30 to +130°C) (0.22 lb, -22 to +266°F)
USPA092	Acoustic couplant high temperature type (non-adhesive) (100 g, -30 to +200°C) (0.22 lb, -22 to +392°F)
USPA097	Acoustic couplant weatherproof type (adhesive) (*10) (100 g, -40 to +180°C) (0.22 lb, -40 to +356°F)

*10: The operating condition of ambient temperature is as below.
Before and during curing : 0 to +50°C / 32 to 122°F
After curing : -40 to +180°C / -40 to 356°F

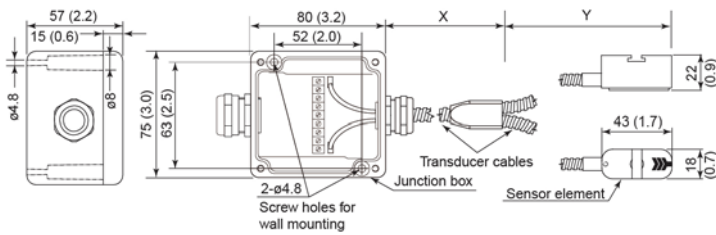
■ Dimensional Drawing

Ultrasonic flowmeter US300FM

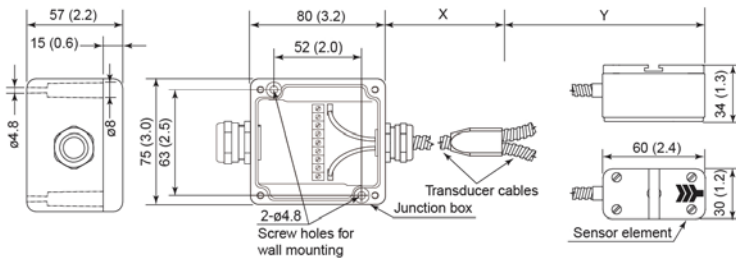
Unit: mm (inch)



Transducers US300FT-□B□



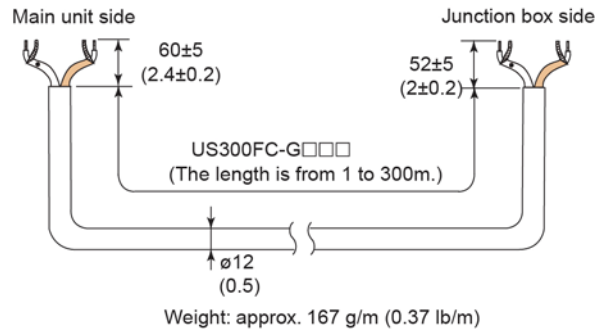
Transducers US300FT-□C□, US300FT-□D□



Transducers	X m (inch)	Y m (inch)	X+Y m (inch)	Weight kg (lb)
US300FT-□B□	2.0 (78.7)	1.0 (39.4)	3.0 (118.1)	0.9 (1.98)
US300FT-□C□	2.0 (78.7)	2.4 (94.5)	4.4 (173.2)	1.5 (3.31)
US300FT-□D□	5.0 (196.9)	7.0 (275.6)	12.0 (472.4)	2.5 (5.51)

Standard Specifications

Connection Cable US300FC

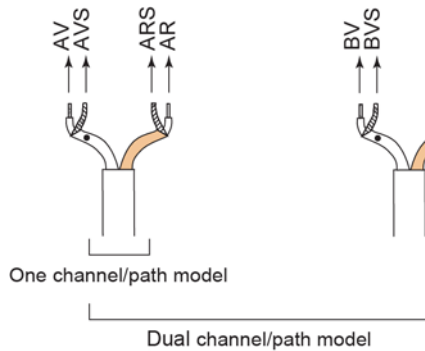


■ Wirings

Terminal Layout



Cable Connection



Terminal Designations

Terminal Name	Description	Terminal Name	Description
AV	Downstream transducer signal for channel A	P1+	Current output (+,-)
AVS	Upstream transducer signal for channel A	P1-	Current output (+,-) when specifying "two current outputs"
AR	Downstream transducer signal for channel B	P2+	Frequency output (+,-)(optional)
ARS	Upstream transducer signal for channel B	P2-	Binary (pulse or alarm) output (optional)
BV	Sensor ROM for channel A	P3+	Same as above
BVS	Sensor ROM for channel B	P3-	Earth
BR		P5a	Neutral
BRS		P5b	AC power supply (100 to 230 V AC \pm 10%)
SA1		P6a	
SA2		P6b	
SA3		PE	
SA4		N(-)	
SB1		L(+)	
SB2			
SB3			
SB4			

*1: Either of these according to specified power supply specification.